

## DuoMAG™ TMS

MAGNETIC | STIMULATION

The DuoMAG magnetic stimulators are among some of the most versatile magnetic stimulators for neuroscience research.

There are three models available; the DuoMAG MP for monophasic TMS, the DuoMAG MP Dual for paired-pulse stimulation and the DuoMAG XT for rTMS.

### DuoMAG MP

The DuoMAG MP is a well-specified monophasic stimulator:

Maximum repetition rate	2Hz
Maximum repetition rate at 50%	0.5Hz
Pulse width (rise/decay)	100µs/1ms
Synchronisation/control	TTL in/out and/or USB

From a purely practical point of view, it's the lightest magnetic stimulator available weighing in at just 17Kg and measuring 49cm x 19cm x 38cm and is available with it's own trolley making it easy to maneuver around a lab environment.



The MP is controllable from the coil, computer interface or via an external trigger, which gives the user greater flexibility and ease of use as it reduces the need to remove the hand from the coil/head to adjust settings.

It's quick and easy to set up as there is no need for additional, specialist software or computers. You can just plug it in and operate via the coil controls or for more complex set-ups via your own script in Matlab or similar.

When considering performance, the DuoMAG MP challenges market leading monophasic stimulators and is at least as comparable with the other stimulators producing "comparable measurements of common markers for corticospinal excitability and intracortical inhibition"

For more information ([see poster by D. Austin, R. Hannah, P. Hammond & J. Rothwell - Comparison of pulse waveform and effects of transcranial magnetic stimulation with novel and established stimulation devices](#))

### DuoMAG MP-Dual

The MP-Dual for paired pulse monophasic TMS combines two MP stimulators to provide a fully configurable paired pulse TMS system. This combination allows individual control of amplitude of both stimulators, offers the capability of setting inter stimulus interval (ISI) and delivery of defined paired-pulse stimulation through a single coil. As a result you can deliver precise sub- and supra-threshold conditioning and test pulses, useful for the investigation of intercortical and intracortical inhibition and facilitation.

As well as the specifications of the DuoMAG MP (as above), the MP-Dual also delivers the following:

Pulse width (rise/decay)	100 or 120µs/1 or 1.2ms
Inter Stimulus Interval	0 to 600ms

Greater flexibility is given by the ability to adjust the ISI for the two pulses from either the supplied software or through external TTL inputs.

With the DuoMAG MP-Dual users can combine two stimulator pulses into a single pulse, giving a pulse amplitude that is equal to 140% of a single DuoMAG MP output.

This high power single pulse mode is useful for individuals with very high thresholds (e.g. Asian vs Caucasian). This functionality was originally developed to allow for stimulation of infants who also have a really high threshold due to incomplete myelination of the nerves which in turn makes them poor conductors of electricity and therefore requires more power in to get an effect out. The Asian effect is thought to be as a result of different head physiology and skull thickness, but has the same effect. The fact that the MP-Dual gives this level of power output means that you have greater headroom for effective stimulation compared to other devices on the market.



And if you're looking to carry out interhemispheric (bilateral) stimulation, then this device can also be used with two separate coils, simultaneously.

The MP Dual comes with the same standard features as the MP – flexible control options, custom protocol editor and user friendly, optional, touch screen software interface.

## DuoMAG XT

The DuoMAG XT for repetitive TMS (rTMS) is a compact and flexible bi-phasic stimulator available in three variations each with a specific maximum frequency - DuoMAG XT-10; XT-35 and XT-100.



They all come with many of the same standard features as the DuoMAG MP and MP Dual devices such as flexible control options, configurable via a Windows based touch screen, available with cart/trolley as well as features specific for rTMS investigations.

The custom protocol editor allows the saving of any conceivable design including stimulation trains, ThetaBurst stimulation (iTBS – cTBS) and changing stimulation intensities which is ideal if you're planning an elaborate protocol setup and configuration.

Pulse mode	Biphasic, repetitive (XT-10); Biphasic, repetitive, burst (XT-35 & XT-100)
Max repetition rate	10Hz (XT-10); 35Hz (XT-35); 100Hz (XT-100)
Max repetition rate at 100%	5Hz (XT-10); 13Hz (XT-35); 22Hz (XT-100)
Min interstimulus interval in train mode	1ms
Pulse width	290µs

It is useful to mention that at 50Hz repetition rate the 50% the XT-100 can reach up to 67% stimulation intensity, which is particularly significant as it allows for higher intensities of stimulation when using theta burst protocols. The power/frequency relationship of these devices are some of the best of all the systems available and this is reinforced by the fact that the relationship is not affected by different mains voltages (110v/220v). No other TMS device is able to match this.

All of these devices are compatible with the Brainsight TMS navigation system and the TruScan Research EEG device.

## Coils and Accessories

There is a good selection of coils and accessories available with the DuoMAG stimulators including:

**DuoMAG Coil** - 30BF, 50BF, 50BF-T, 70BF, 120BFV, 100R, 125R and 70BF Cool Coil (air cooled fan for all day use without overheating) and 70BF Cool Placebo.



DuoMAG 2 channel MEP amplifier  
DuoMAG MagCart  
DuoMAG MagTower



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